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# SANITATION GUIDELINES FOR SALMONELLA CONTROL

## *in Processing Industrial Fishery Products*

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National Fisheries Institute

Bureau of Commercial Fisheries,
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American Feed Manufacturers Association

American Veterinary Medical Association

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United States Livestock Sanitary Association

Consumer and Marketing Service
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U.S. Department of Agriculture

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Prepared by
Animal Disease Eradication Division
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# SANITATION GUIDELINES FOR SALMONELLA CONTROL IN PROCESSING INDUSTRIAL FISHERY PRODUCTS

Fresh whole fish and fresh raw or cooked fish material from filleting or cannery lines are used in the manufacture of fish meal, an ingredient used in livestock and poultry feeds.

Reports of individual and cooperative studies, both domestic and foreign, have told of the contamination or recontamination of dried fish scrap and meal with *Salmonella* micro-organisms. These studies indicate that the contamination most likely occurs in handling and storing the finished product.

The following guidelines outline operating procedures and product handling methods for fish meal processors that, with good management, should result in *Salmonella*-free product.

The fish industry and/or allied utilization industries should consider giving special recognition to processors who operate under these guidelines.

## PLANT BUILDINGS

Plant buildings and other housing facilities vary widely in size and construction depending upon the source and availability of the raw material used.

***Screening to control rodents, birds, and insects.***

The newer and more modern plants are of steel and concrete or masonry construction and are geared to fit the manufacturer's needs.

The housing facilities for the plant's processing equipment and for handling and storing processed material should definitely be divided into separate areas. These areas should be either in separate buildings or effectively separated by a wall extending from the floor to the ceiling.

Where more than one building is used for this purpose it is recommended that paved, hard-surfaced walks or driveways that can be kept clean and dry be

provided to connect the buildings. If practical, these passageways should be covered.

Protect all entryways to processed material areas (those parts used for curing, turning, storing, grinding, and loading of dried scrap or meal) by shallow pans containing a pad or mat wet with disinfectant. The pan should be the length of the entryway and wide enough so as not to be easily stepped across. Maintenance is important. Do not allow pads to dry out or become filled with dirt, and use a stable disinfectant of adequate strength in the pan.

Place containers and scrub brushes and a disinfecting solution outside all entryways of the processed-material area. All personnel should scrub off their footwear by using the disinfecting solution and a stiff brush before entering the area. This procedure is one of the most important in the effort to prevent *Salmonella* contamination of the finished product.

***Processed-material areas and raw-material areas are in separate buildings in the modern plants.***

***All entryways to processed-material areas should be protected by shallow pans with a disinfectant pad.***

Do not permit live animals and birds in processed-material areas.

Continually maintain rodent, vermin, bird, and insect control in the plant.

Equipment such as shovels and brooms used in the processed-material area should be specially marked and used only in the processed-material areas. Tractor-driven scrapers used in moving piles of scrap should not be used outside the scrap-curing and storage area.

Pay particular attention to protection of the processed-material area. Keep it clean of refuse, trash, and discarded and broken machinery. Press cake should never be held in the processed-material area.

Having produced a product that is not contaminated with *Salmonella*, the objective is to prevent contamination while in storage.

It is recommended that the buildings used for handling and processing of raw fish material or for storage of the processed product not be used for other business purposes.

In general, fish scrap and meal processors should strive to maintain forward movement of the processed material through the plant, with adequate precautions during storage and shipping to prevent post-processing contamination from in-plant and outside sources.

## MOISTURE CONTROL

Cookers, presses, and other wet-material processing equipment should be so constructed and located that moisture rising from it or any possible spillage or leakage will not be carried into the processed-material area.

Storage-area walls, floors, and roof should be leakproof to keep out moisture and to keep the processed product dry at all times. As all microorganisms require moisture to grow and multiply, scrap curing and storage areas must be kept dry.

## PERSONNEL

Key plant personnel should be trained as security or safety officers to ascertain that all aspects of the guidelines are carried out.

All plant employees should be thoroughly trained in plant sanitation guidelines and in the need for strict adherence to an accepted set of procedures.

It is preferred that personnel assigned to the raw-material area—which includes all areas used for unloading, measuring, transporting, handling, or storing raw fish or incompletely processed fish material—should not be used in the processed-material area and vice versa. Where the same personnel is required to work in both areas, it is suggested that they change to specially marked outer clothing, caps, and footwear provided for each area. Personnel handling raw material should wash their hands before going to work in the processed-material area.

Adequate washing, showering, and dressing facilities should be available for employees.

***Vessel holds are thoroughly washed down with clean water and disinfectant after each unloading.***

***Water free of* Salmonella *is used to pump fish from the hold.***

## RAW MATERIAL

Whole fish are normally delivered directly to the plant by the catching vessel. In the unloading operation, it is recommended that water free of *Salmonella* should be used in pumping fish from the boat.

Truckbeds, tanks, and barrels used to hold and transport fish material from processing lines to fish meal plants should be leakproof and so constructed that no drippings or seepage can escape. Keep them in sanitary condition.

Raw material is defined as all fish material used in the manufacturing process. Controlled cooking and

***A source of steam and a tank for detergent or disinfectant solutions to be used with a high-pressure jet are aids to thorough cleaning.***

processing procedures should be initiated to assure that the raw material is heated throughout to a temperature sufficient to kill all *Salmonella* organisms.

## CLEANING AND DISINFECTING

For cleaning the raw-material processing equipment, a cleaning agent in hot-water solution used with a steam gun or high-pressure jet to loosen and remove grease and all other material sticking to the surface is recommended. Use a good commercial detergent.

All surfaces should be free of grease and accumulated material following the cleaning operation prior

to applying the disinfecting solution. A disinfectant having recognized germicidal properties should be used. (Spraying with a solution of sodium hypochlorite providing 1000 parts per million of available chlorine would be satisfactory for this purpose.)

## DUST CONTROL

In the curing process for dried-fish scrap, employing the dropping method for aerating and cooling, the small particles of the processed material that collect on the floor in the vicinity of the scrap pile should be cleaned up during intervals when conveyors are not operating. After the fish scrap has been moved out and the shed is empty, it should be cleaned of residues of scrap and dust before receiving new materials.

***Dust control and floor sanitation in the curing area is of prime importance.***

Continuous attention should be given to controlling and removing accumulated processed-product dust that settles on shelves, window sills, and equipment. This may be accomplished best by vacuuming. Do not use water or steam for removing dust in the curing and storage area because it will allow formation of pockets or pools of damp processed material in which micro-organisms may grow.

## CONTAINERS AND TRANSPORTATION

Use only new or sterile bags for packaging processed material. Clean bag supplies should be stored in such a manner that they do not become contaminated.

The equipment used for transporting the processed material is a serious potential source for contaminating a *Salmonella*-free product during shipment. Generally, this equipment is not the property of the shipper, and thus there are acknowledged difficulties in maintaining it in clean condition. Even so, all equipment should be inspected before loading to see that it has been properly cleaned. If it is not clean, it should receive proper cleaning. All carriers are urged to cooperate in providing clean equipment.

## SAMPLING AND LABORATORY EXAMINATION

Take samples of the processed material at time of shipment. Periodically submit a representative sample

***Use sterile containers for packaging processed materials.***

for laboratory examination to determine adequacy of the processing, handling, and storage methods in producing a *Salmonella*-free product. Obtain a sample by taking 1 tablespoonful of material from each ton of the shipment. (In bulk shipments, take this at appropriate intervals of time depending on the loading rate as material is loaded; in packaged material, take

it from each 20th bag.) Place these samples in a new, clean, secure container, label the container with the shipment number, date it, and mail it to the laboratory.

Keep sterile all containers and instruments used in collecting samples.

*Salmonella*-free material is that processed material in which the presence of *Salmonella* is not detectable when sampled by procedures outlined in this guideline and subjected to laboratory examination. Laboratory examination is to be done as outlined in USDA publication (ARS 91-36) "Recommended Procedures for the Isolation of *Salmonella* Organisms From Animal Feeds and Meat Byproducts."

If laboratory examinations of processed products find contamination, the sanitation procedures of the plant should be reexamined and corrective measures instituted.

# POINTS TO REMEMBER ABOUT *SALMONELLA*

1. The organisms grow and multiply in raw material.

2. The organisms are killed by heating to 180°F. or to 165°F. for 20 minutes.

3. Processed material should be free of *Salmonella* when it comes from properly operated dryers.

4. Processed material may become contaminated from the raw-material area by—

- Men and equipment going from raw-material area into the processed-material area,
- Dust or moisture rising from the raw-material area and settling in the processed-material area, and
- Insects, rodents, and birds going from raw-material area into processed-material area.

5. Contaminated processed material can produce disease in livestock and poultry when mixed in their feed, and disease can then spread from them to man.

6. We can help prevent this spread of disease by building a wall of defense between the raw-material area and the processed-material area.

## A WALL OF DEFENSE

Allow only authorized persons in the plant.

Never let rodents and birds inhabit the plant.

Label plant premises — RAW-MATERIAL AREA and PROCESSED-MATERIAL AREA.

Label coveralls and tools as assigned to RAW-MATERIAL AREA or PROCESSED-MATERIAL AREA.

Stay in your assigned area.

Clean all areas and equipment to prevent buildup of pockets of *Salmonella* contamination.

Prevent moisture rising off raw material from circulating through the plant.

Prevent air and dust circulation between RAW-MATERIAL AREA and PROCESSED-MATERIAL AREA.

Leaving RAW-MATERIAL AREA? Stop! Clean and disinfect footwear and tools.